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Fluoroqunilone resistance in Shigella over a decade In India: Do we have Plasmid-mediated quinolone resistance?

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Background: The *qnr* gene family consists of plasmid mediated quinolone resistance (PMQR) genes that confer low level resistance to nalidixic acid and reduced susceptibility to ciprofloxacin. At our tertiary care referral centre in Chandigarh, which caters to a large population of 5 neighboring states, antibiotic resistance in *Shigella* is being constantly monitored

Methods & Materials: We screened 139 S.flexneri and 38 S. dysenteriae serotype 1 isolated during 2001 to 2011,for PMQR (qnrA, qnrB, qnrS, aac(6′)-Ib-cr and qepA) genes. MICs were determined for nalidixic acid and ciprofloxacin by E-test. The isolates were classified as susceptible (MICs <0.5 mg/L) or resistant (MICs ≥1 mg/L) to ciprofloxacin; susceptible (MIC ≤ 16) or resistant (MIC ≥ 32) to nalidixic acid respectively. Those positive for PMQR were tested for ESBL (CLSI).

Results: Eleven (6.12%) isolates, were found to harbor PMQR, out of which 2 were positive for qnrS1 gene (S. flexneri),while 9 for aac(6′)-Ib-cr gene (6 S. flexneri and 3 S. dysenteriae). No strain harbored both genes. None were positive for qnrA, qnrB, qnrD and qepA genes. Out of 11 PMQR positive isolates, 3 showed ciprofloxacin MIC of ≥32 mg/L while 9 strains were resistant to nalidixic acid with a MIC of > 128 mg/L, 3 were positive for CTX-M-15 and 1 for CMY-2 gene. The aac(6′)-Ib-cr gene was detected as early as 2002,combination of CTXM-15 with aac(6′)-Ib-cr appeared in 2005 and qnrS1 appeared recently in 2010. PMQR could not be the direct reason for quiniolone and fluoroquinolone resistance in these strains. Sequencing of gyrA and parC revealed three mutations on the QRDR of each of the 11 PMQR positive strains, thought to be primarily responsible for quinolone resistance phenotype

Conclusion: After description of qnrS1 *Shigella* in Japan, China and USA, we report the first description of qnrS1 *Shigella* in India. Furthermore, combination of PMQR and CTXM-15 genes is being reported here for the first time in *Shigella*. The close association of *aac(6′)-Ib-cr*, with CTX-M-15 is of great concern as CTX- M-15 has emerged worldwide. The two *qnr*S1 strains detected were from 2010, indicating a relatively new appearance among *Shigella* in India.

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H1N1 - Monster to be tamed

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Background: There is an increase in H1N1 patients in our community leading to morbidity and mortality. This study aimed to assess the epidemiology and characteristics of H1N1 patients requiring intensive care unit admission.

Methods & Materials: The retrospective cohort study included 14 H1N1 patients admitted in ICU from November, 2014 to April, 2015. Data was analyzed from patient's medical records. All ICU patients who were tested positive for H1N1 by reverse – transcriptase polymerase – chain reaction assay were included. Patients treated for H1N1 in the ward and out – patient department were excluded. Categorical variables were compared using Fisher's exact test.

Results: In our study, the mean standard error (SE) age was 46.85 (3.85) years and male to female distribution was equal. Majority of the patients presented with dry cough (85.7%), dyspnea (78.6%) and fever (71.4%) on ICU admission. 92.8% patients had moderate to severe adult respiratory distress syndrome. Sequential organ severity assessment score was less than 11 for 92.8% patients. Non- invasive ventilation (NIV) was initiated on 78.6% patients and 6 (42.8%) patients improved on NIV alone. Eight (57.1%) patients needed invasive ventilation and all ventilated patients required prone ventilation within 24 hours. Mean duration of mechanical ventilation was 23.5 (7.21) days and mean duration of prone ventilation was 5.5 (2) days. Tracheostomy was done in 21.4% patients. Complication during ICU stay included ventilator associated pneumonia (75%), critical illness polyneuropathy (12.5%), acute kidney injury (14.3%) and pneumothorax (7.1%). Mean days of ICU stay was 14.7 (4.27) days and mean duration of hospitalization was 23.07 (7.61) days. The 30 days survival rate in our study was 64.3% and mortality was attributed to severe refractory hypoxemia.

Conclusion: H1N1 patients are unique in presentation and management. There is a need for awareness and education for early initiation of Oseltamivir at primary care centers to reduce the severity of H1N1. The patients required longer ventilation and all ventilated patients required prone ventilation. Extra corporeal membrane oxygenation could be considered as rescue therapy in severely hypoxic patients.

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